

31. (Amended) The electroluminescent device according to claim 29, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission including at least one material selected from the group consisting of a fluoride or an oxide of an alkali metal, a fluoride or an oxide of an alkaline earth metal, and a fluoride or an oxide of a group III element in the periodic table.

32. (Amended) The electroluminescent device according to claim 28, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission being disposed only between the anode and the light-emitting layer.

REMARKS

Claims 15-38 and 40 are pending. By the Amendment, claims 39, 41 and 42 are cancelled, and the title, specification and claims 15-19 and 28-32 are amended.

The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)) and claim (37 C.F.R. §1.121(c)(1)(ii)).

Reconsideration based on the following remarks is respectfully requested.

I. The Title Satisfies All Formal Requirements

The Office Action objects to the title as not being descriptive. The title is amended to obviate this objection. Withdrawal of the objection to the title is respectfully requested.

II. The Claims Satisfy the Requirements of 35 U.S.C. §112, Second Paragraph

The Office Action rejects claims 17, 18, 30 and 31 under 35 U.S.C. §112, second paragraph as being indefinite. Specifically, the Office Action asserts that the recitation of "fluoride of an oxide" in the claims and specification is unclear.

The recitation of "fluoride of an oxide" in the claims and specification is a typographical error. Accordingly, "fluoride of an oxide" is changed to --fluoride or an oxide-- in the claims and specification to more clearly recite and describe the invention.

Support for the use of a fluoride or an oxide as the thin film layer can be found in the specification at least at page 5, lines 24-25, which discloses the use of lithium fluoride as the chosen material. Further, column 7, lines 3-14 and claim 4 of EP1018857A1, which is the counterpart European patent application of the present application, discloses the use of a fluoride or an oxide, rather than a fluoride of an oxide.

As discussed above, the recitation of "a fluoride of an oxide" in the specification and claims is clearly a typographical error. Withdrawal of the rejection under 35 U.S.C. §112, second paragraph is respectfully requested.

III. The Claims Define Patentable Subject Matter

The Office Action rejects claims 15-19 and 28-32 under 35 U.S.C. §102(b) over Wakimoto (U.S. Patent No. 5,739,635); claims 41 and 42 under 35 U.S.C. §102(e) over Kanai et al. (U.S. Patent No. 6,121,727); claims 20, 21, 26, 27, 33, 34, 39 and 40 under 35 U.S.C. §103(a) over Wakimoto; claims 22, 23, 25, 35, 36 and 38 under 35 U.S.C. §103(a) over Wakimoto in view of Roitman et al. (U.S. Patent No. 6,111,356); and claims 24 and 37 under 35 U.S.C. §103(a) over Wakimoto in view of JP10-36487 (the 487 patent). These rejections are respectfully traversed.

Wakimoto does not disclose or suggest an electroluminescent device including, inter alia, a means for suppressing current flowing through the light emitting layer and not contributing to light emission disposed at at least one of a position between a light emitting layer and an anode, and a position between the light emitting layer and a cathode, as recited in claim 15, and as similarly recited in claim 28.

Instead, Wakimoto discloses an interface layer which facilitates injection of a charge. Further, although Kanai, which was not used to reject claims 15 and 28, does disclose the use of lithium fluoride as an interface layer between a light emitting layer and a cathode. Kanai does not specifically disclose a means for suppressing current flowing through the light

emitting layer and not contributing to light emission because materials of the light emitting layer and the cathode are not necessarily the same as that of the present invention.

Further, regarding claim 28, none of the applied references disclose a light emitting layer comprising a polymer material, the light emitting layer including the organic polymer being formed by a printing method. As discussed in the specification, the means for suppressing current avoids short circuit caused by any defect resulting from the printing process. Thus, the combination of a polymer layer formed by the printing process and the means for suppressing current flowing through the light emitting layer and not contributing to light emission achieves a highly reliable and effective polymer electroluminescent device by a suitable production process.

Neither Roitman nor the 487 patent make up for the deficiencies of Wakimoto and Kanai. Thus, even combining these references with Wakimoto and/or Kanai would not result in the claimed invention.

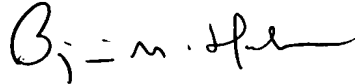
For at least these reasons, it is respectfully submitted that claims 15 and 28 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Applicant respectfully requests that the rejections under 35 U.S.C. §102 and §103 be withdrawn.

IV. Conclusion

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Benjamin M. Halpern
Registration No. 46,494

JAO:BMH/gpn

Attachment:
Appendix

Date: October 31, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
--

APPENDIX

Changes to Title:

The following is a marked-up version of the amended title:

ELECTROLUMINESCENT DEVICE HAVING A THIN-FILM LAYER

Changes to Specification:

Page 3, lines 20-23:

(4) In the electroluminescent device described in one of (1) to (3) above, the thin-film layer is composed of at least one material selected from the group consisting of a fluoride ~~of~~or an oxide of an alkali metal; a fluoride ~~of~~or an oxide of an alkaline earth metal; and a fluoride ~~of~~or an oxide of a group III element in the periodic table.

Page 9, lines 2-5:

In this Example, an example will be described, in which a fluoride ~~of~~or an oxide of an alkali metal; a fluoride ~~of~~or an oxide of an alkaline earth metal; or a fluoride ~~of~~or an oxide of a group III element in the periodic table, is used for the thin-film layer of the structure shown in Fig. 1.

Page 9, lines 11-18:

In this example, calcium fluoride was used by deposition as the thin-film layer; however, lithium fluoride may also be used. In addition, a fluoride ~~of~~or an oxide of an alkali metal, such as lithium, sodium, or potassium; a fluoride ~~of~~or an oxide of an alkaline earth metal, such as beryllium, magnesium, calcium, or scandium; and a fluoride ~~of~~or an oxide of a group III element in the periodic table, such as boron, aluminum, or gallium, may also be used. In addition, a material that has adequate electrical insulating properties, easy film formability, and suppression of unnecessary current which does not contribute to light emission, may also be used.

Changes to Claims:

Claims 39, 41 and 42 are canceled.

The following is a marked-up version of the amended claims:

15. (Amended) An electroluminescent device, comprising:

a light-emitting layer including at least an organic polymer and disposed between an anode and a cathode; and

a thin film layer means for suppressing current flowing through the light-emitting layer and not contributing to light emission disposed at at least one of a position between the light-emitting layer and the anode, and a position between the light-emitting layer and the cathode, ~~the thin film layer suppressing unnecessary current that does not contribute to light emission.~~

16. (Amended) The electroluminescent device according to claim 15, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission ~~thin film layer~~ being disposed only between the cathode and the light-emitting layer.

17. (Amended) The electroluminescent device according to claim 15, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission ~~thin film layer~~ including at least one material selected from the group consisting of a fluoride ~~of~~ or an oxide of an alkali metal, a fluoride ~~of~~ or an oxide of an alkaline earth metal, and a fluoride ~~of~~ or an oxide of a group III element in the periodic table.

18. (Amended) The electroluminescent device according to claim 16, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission ~~thin film layer~~ including at least one material selected from the group consisting of a fluoride ~~of~~ or an oxide of an alkali metal, a fluoride ~~of~~ or an oxide of an alkaline earth metal, and a fluoride ~~of~~ or an oxide of a group III element in the periodic table.

19. (Amended) The electroluminescent device according to claim 15, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission~~thin-film layer~~ being disposed only between the anode and the light-emitting layer.

28. (Amended) An electroluminescent device, comprising:
a light-emitting layer including at least an organic polymer and disposed between an anode and a cathode, the light-emitting layer including the organic polymer being formed by a printing method; and
means for suppressing current flowing through the light-emitting layer and not contributing to light emission~~a thin-film layer~~ disposed at at least one of a position between the light-emitting layer and the anode, and a position between the light-emitting layer and the cathode, ~~the thin-film layer suppressing unnecessary current that does not contribute to light emission, the organic polymer performing light emission in the wavelength range of 400 nm to 600 nm.~~

29. (Amended) The electroluminescent device according to claim 28, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission~~thin-film layer~~ being disposed only between the cathode and the light-emitting layer.

30. (Amended) The electroluminescent device according to claim 28, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission~~thin-film layer~~ including at least one material selected from the group consisting of a fluoride ~~of~~ or an oxide of an alkali metal, a fluoride ~~of~~ or an oxide of an alkaline earth metal, and a fluoride ~~of~~ or an oxide of a group III element in the periodic table.

31. (Amended) The electroluminescent device according to claim 29, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission~~thin-film layer~~ including at least one material selected from the group consisting of a

fluoride ~~of~~ or an oxide of an alkali metal, a fluoride ~~of~~ or an oxide of an alkaline earth metal, and a fluoride ~~of~~ or an oxide of a group III element in the periodic table.

32. (Amended) The electroluminescent device according to claim 28, the means for suppressing current flowing through the light-emitting layer and not contributing to light emission ~~thin film layer~~ being disposed only between the anode and the light-emitting layer.